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# ABSTRACT

A micromachined vertical vibrating gyroscope consists of three single crystal silicon assemblies: an outer single crystal silicon assembly, an intermediate single crystal silicon assembly, and an inner single crystal silicon assembly. The outer assembly includes a plurality of arc-shaped anchors arranged in a circle and extending from a single crystal silicon substrate coated with an insulating annulus thereon. The intermediate assembly is a suspended wheel concentric with the arc-shaped anchors. The inner assembly is a suspended hub concentric with the circle formed by the anchors and having no axle at its center. The three assemblies are connected to each other through several flexures. The intermediate suspended wheel is driven into rotational vibration by lateral comb capacitors. Input angular rates are measured by two vertical capacitors. The gyroscope is fabricated utilizing a bipolar-compatible process comprising steps of buried layer diffusion, selective epitaxial growth and lateral overgrowth, deep reactive ion etching, and porous silicon processing.